



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of: )

Brian E. Lemoff et al. )

Serial No.: 09/873,127 )

Filed: June 1, 2001 )

For: *Non-Blocking Mechanical Fiber*  
*Optic Matrix Switch* )

Examiner: Sung H. Pak

Group Art Unit: 2874

Confirmation: 3243

**BRIEF ON APPEAL**

Honorable Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Dear Sir:

Brian E. Lemoff, Charles D. Hoke and Dale W. Schroeder, hereinafter referred to as "Applicants," hereby appeal to the Board of Patent Appeals and Interferences from the examiner's final Office Action, mailed June 26, 2003. This Brief is submitted in accordance with 37 CFR §1.192.

**I. REAL PARTY IN INTEREST**

All rights to the subject patent application have been assigned to Agilent Technologies, Inc., hereinafter referred to as "Agilent", a Delaware corporation with its principal offices located in Palo Alto, California. Agilent is the real party in interest.

**II. RELATED APPEALS AND INTERFERENCES**

There are no other related appeals or interferences known to Applicants, Applicants' undersigned legal representative, or Applicants' assignee (Agilent).

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Brief on Appeal

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### III. STATUS OF CLAIMS

Claims 1- 25 were originally filed with the application on June 1, 2001. In an Amendment filed April 28, 2003 Claims 3, 6, 7, 9, 10, 13 - 15, 19 and 21 - 25 were canceled, Claims 1, 5, 8, 11 and 20 were amended and Claims 26 - 28 were added. Claims 1, 2, 4, 5, 8, 11, 12, 16 - 18, 20 and 26 - 28 are currently pending and stand rejected. All of the claims in the form appealed are set forth in the Appendix hereto.

### IV. STATUS OF AMENDMENTS

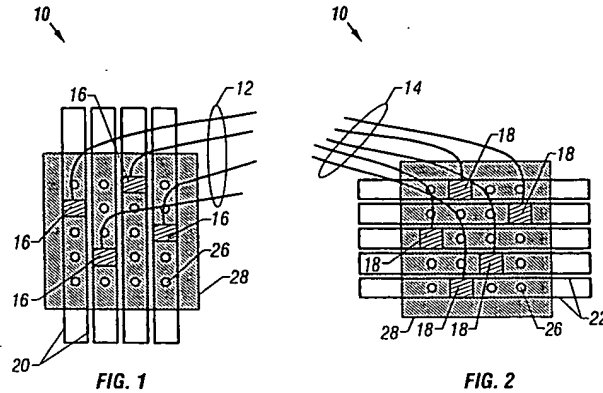
The lone Amendment filed April 28, 2003 in response to the first Office Action has been entered. A Request for Reconsideration was filed on August 26, 2003 in response to the second (final) Office action mailed June 26, 2003 but the examiner indicated in an Advisory Action mailed September 18, 2003 that it did not place the application in consideration for allowance. No drawing corrections have been made or proposed.

### V. SUMMARY OF THE INVENTION

A total of three (3) independent claims are on appeal (Claims 1, 11 and 20). The present invention, as defined in independent apparatus Claims 1 and 20, is generally directed to a non-blocking mechanical fiberoptic matrix switch comprising N input optical fibers and M output optical fibers that have their end portions supported on stages that are translated along overlapping paths (Claim 1) or orthogonal X and Y axes (Claim 20) to permit a beam of light to be transmitted between selected input and output fibers either via collimating lenses (Claim 1) or via means for moving ferrules surrounding the fiber end portions along corresponding Z axes (Claim 20). Independent method Claim 11 requires the steps of supporting the end portions of the N input optical fibers and M output optical fibers for independent translational movement along overlapping paths, and translating selected ones of the N and M optical fibers into alignment to permit a beam of light to be transmitted therebetween via collimating the beam of light.

Figs. 1 and 2 of the subject application are reproduced hereafter and illustrate in diagrammatic form the input and output sides, respectively, of a preferred embodiment of the claimed non-blocking mechanical fiberoptic matrix switch 10 with N = 4 input optical fibers 12 and M = 5 output optical fibers 14. Four stages 16 support the end portions of

corresponding input optical fibers 12 for independent movement along parallel Y axes defined by spaced apart rails 20. Five stages 18 support the end portions of corresponding output optical fibers 14 for independent movement along parallel X axes defined by spaced apart rails 22.



FIGS. 1 and 2 of Lemoff et al. (Applicants)

Fig. 4 of the subject application is reproduced hereafter and is an enlarged fragmentary diagrammatic horizontal sectional view of the switch 10 of Fig. 1 illustrating structure for moving a ferrule 24 around output optical fiber 14 along a Z axis into and out of an alignment hole 26 in a central rectangular panel 28 via solenoid actuator (not illustrated in Fig. 4) on stage 18 to mate the facet of output optical fiber 14 with the facet of a selected input optical fiber 12 whose ferrule 24 is inserted along the Z axis into the same alignment hole 26 via stage 16 illustrated diagrammatically as a cylinder in Fig. 4 and also having a solenoid actuator.

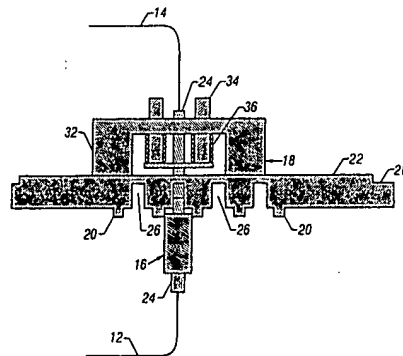


FIG. 4 of Lemoff et al. (Applicants)

Figs. 6A and 6B of the subject application are reproduced hereafter and illustrate alternative embodiments of the subject invention in which each fiber has a lens 38 (Fig. 6A) or other collimating device attached to its facet, or in which a lens 40 (Fig. 6B) or other collimating device is positioned in each hole 26 in the central rectangular panel 28, thereby eliminating the need to move the end portions of the input and output optical fibers 12 and 14 along corresponding Z axes.

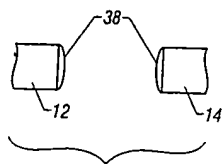


FIG. 6A

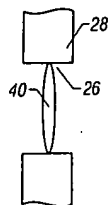


FIG. 6B

FIGS. 6A and 6B of Lemoff et al. (Applicants)

## **VI. ISSUES**

Whether the subject matter of Claims 1, 2, 4, 5, 8, 11 - 12 and 16 - 18 would have been obvious to one of ordinary skill in the art over Kobayashi et al. (JP 06 - 258584) in view of Mock (U.S. Pat. No. 5,664,034).

Whether the subject matter of Claims 20 and 26 - 28 would have been obvious to a person of ordinary skill in the art over Kobayashi et al. (JP 06 - 258584) in view of Takahashi (U.S. Pat. No. 6,307,982).

## **VII. GROUPING OF THE CLAIMS**

For each ground of rejection which Appellant contests herein that applies to more than one claim, such additional claims, to the extent separately identified and argued below, do not stand or fall together.

## **VIII. ARGUMENT**

With regard to the obviousness rejections of Claims 1, 2, 4, 5, 8, 11, 12 and 16 - 18 the examiner's position is that it would have been obvious to modify Kobayashi et al. to have collimating lenses as allegedly taught by '034 Mock. Amended Claim 1 requires "a plurality of collimating lenses, each for transmitting a beam of light between aligned input and output fibers." Amended Claim 11 requires the step of "collimating each beam of light between aligned input and output fibers." The examiner's proposed combination defeats the fundamental design of the Kobayashi et al. switch which depends upon pulley mechanisms 17 and 27 to insert and withdraw ferrules 12 and 22 on the optical fibers of groups 10 and 20, respectively, relative to sleeves 3 in change connection board 1. The lenses 26 of '034 Mock collimate light from input fibers 27 and carry it a substantial longitudinal distance through free space to photo detectors 34. The Kobayashi et al. switch depends on close-proximity Z-axis movement and mating of the input and output fiber ends and has no need for the lenses 26 of '034 Mock. Independent Claims 1 and 11 do not require any Z-axis motion of the optical fibers and, therefore, advantageously employ the recited collimating lenses and collimating step. There is no express or implied suggestion in Kobayashi et al. or '034 Mock to modify the Kobayashi et al. switch as proposed by the examiner. Moreover, a motivation to combine the teachings of prior art

references requires desirability of making the proposed combination, not merely a tradeoff. A tradeoff concerns what is feasible, not what is necessarily desirable. Motivation to combine requires the latter. *Winner International Royalty Corp v. Wang*, 202 F.3d 1340, 53 USPQ2d 1580 (Fed. Cir.), *cert. denied*, 530 U.S. 1238(2000). Accordingly, reversal of the obviousness rejections of Claims 1 and 11, and Claims 2, 4-5, 8, 12 and 16-18 which depend therefrom, is requested.

With regard to the obviousness rejections of Claims 20 and 26-28 the examiner's position is that it would have been obvious in light of '982 Takahashi to modify the Kobayashi et al. switch "to have a mechanism that moves fiber ferrules relative to the switching stage." Amended Claim 20 requires "means for moving the ferrules relative to the stages along a plurality of Z axes generally perpendicular to the X and Y axes to mate and un-mate the facets of the selected input and output optical fibers." The '982 Takahashi switch has a single unnumbered input optical fiber with a ferrule 29 that can be moved along X and Y axes and inserted along the Z-axis via latching solenoid 37 into a selected one of a plurality of line-up sleeves 12. An array of output optical fibers 14 have their ferrules 13 permanently inserted in the other sides of the line-up sleeves 12. The examiner's proposed modification of the Kobayashi et al. switch would require elimination of the pulley move mechanisms 17 and 27 and the mounting of a plurality of the large Z-axis drive mechanism A of '982 Takahashi (Fig. 1 and column 6, lines 15 – 42) on the ferrule drive wires 16 and 26 of Kobayahsi et al. (Fig. 1) There is no express or implied motivation in either Kobayashi et al. or '982 Takahashi for such a modification. Moreover, such a modification would not have had a reasonable chance of success since it would be difficult to mount, stabilize and align the Z-axis ferrule moving mechanism of '982 Takahashi on the ferrule drive wires 16 and 26 of Kobayashi et al. The substantial weight of the plurality of Z-axis drive mechanisms A of Takahashi would cause the ferrule drive wires 16 and 26 of Kobayashi et al. to twist. The Z-axis drive mechanisms A would also vibrate when the winding motion of the ferrule drive wires 16 and 26 halted on attaining the desired X – Y position. The use of some sort of Z – axis alignment mechanisms would be required to prevent twisting and vibration, however they would prevent X-Y translation of the ferrules 13 and 23. In order for a proposed modification of a prior art reference to have been considered obvious to one of ordinary skill in the art, there must have been a reasonable expectation of success. *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F3d 1120, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000). Accordingly, reversal of the obviousness rejection of Claim 20, along

with Claims 26-28 which depend therefrom, is requested.

## **IX. CONCLUSION**

For the foregoing reasons, withdrawal of the obviousness rejections of Claims 1, 2, 4, 5, 8, 11, 12, 16 - 18, 20 and 26 - 28 is requested.

Respectfully submitted,

 10/27/03

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